AMENDMENTS TO THE CLAIMS

The following listing of claims replaces all previous claim listings and versions:

1. (Currently Amended) A method of making an optical information storage medium, the method comprising:

(a) disposing a polymerizable composition between a base and a covering layer, at least one of the base and the covering layer having a first relief pattern on a side facing the polymerizable composition;

(b) spinning the base, the polymerizable composition and the covering layer in a centrifuge to distribute the polymerizable composition;

(c) polymerizing the polymerizable composition while the polymerizable composition is distributed between the base and the covering layer to form a polymerized layer having a second relief pattern corresponding to the first relief pattern;

(d) separating the polymerized layer from the first relief pattern; and

(e) filling the second relief pattern with a fluorescent information storage material by providing a filling composition comprising a fluorescent dye; and filling the second relief pattern with the filling composition, with the filling composition comprising a polymerizable substance and a solvent, wherein the polymerizable substance comprises glycidyl ether in an amount of 0.1-85 wt% of the substance, epoxide in an amount of 5-90 wt% of the substance, and a first alcohol in an amount of 0-10 wt% of the substance, and wherein the solvent comprises a second alcohol that is different from the first alcohol.

2. (Currently Amended) The method of claim 1, wherein[[:]] the polymerizable composition is photopolymerizable in light having a photopolymerizing wavelength; the covering layer is transparent to the photopolymerizing wavelength; and step (c) comprises applying the light having the photopolymerizing wavelength to the polymerizable composition through the covering layer.

3. (Withdrawn) The method of claim 2, wherein the polymerizable composition comprises 20 wt% of 1,6-hexanediol diacrylate (HDDA), 35 wt% of ethoxylated o bisphenol A diacrylate, 20 wt% of epoxy novolac acrylate oligomer in HDDA, and 2 wt% of Darocure 1173.

4. (Withdrawn) The method of claim 2, wherein the polymerizable composition comprises 63 wt% of polyester acrylate, 37 wt% of styrene and 2 wt% of benzoin isobutyl ether.

5. (Withdrawn) The method of claim 2, wherein the polymerizable composition comprises 23 wt% of modified urethane triacrylate, 5 wt% of 2-(2-ethoxyethoxy)ethyl-acrylate, 15 wt% of monopropyleneglycol acrylate, 57 wt% ofpropoxylated trimethylopropane triacrylate, and 2% of Irgacure 784.

6-7. (Cancelled)

8. (Withdrawn) The method of claim 6, wherein step (c) comprises using a photoinitiator comprising 2 wt% of camphorquinone and 1 wt% of triethanolamine.

9. (Withdrawn) The method of claim 6, wherein step (c) comprises using a photoinitiator comprising 1 wt% of eosin B, 1 wt% of dibutylaniline and 2 wt% of Irgacure 651.

10. (Withdrawn) The method of claim 2, wherein the polymerizable composition comprises 50 wt% ethoxylated bisphenol A diacrylate, 10% pentaerythritol triacrylate, 40 wt% of tripropylene glycol triacrylate and 1wt% of Irgacure 1700.

11. (Withdrawn) The method of claim 2, wherein the polymerizable composition comprises oligocarbonate methacrylate, 1% of Irgacure 651 and 1% of Irgacure 1173.

12. (Withdrawn) The method of claim 2, wherein the polymerizable composition comprises 20 wt% of poly(vinyl butyral-co-vinyl alcohol-co-vinyl acetate) M.W. 70000, 50 wt% of 1,6hexanediol diacrylate, 30 wt% of 4-vinyl-1-cyclohexane 1,2-epoxide, 1 wt% of Irgacure 500, 2 wt% of UVI 6974 and 2 wt% of triarylsulfonium hexafluoroantimonate.

13. (Withdrawn) The method of claim 2, wherein: the polymerizable composition comprises 10% of 3,4-epoxycyclohexylmethyl-3,4-epoxycyclohexane carboxylate, 2% of polypropylenglycol M.W. 400, 15 wt% of tripropyleneglycol divinyl ester, 15 wt% of trimethylolpropane triacrylate, and 58 wt% of olygocarbonate methacrylate (OCM-2, Alvar-

M, Ltd.); and step (c) comprises using a photoinitaiator comprising 2% Irgacure 500 and 2% triarylsulfonium hexafluorophosphate.

14. (Withdrawn) The method of claim 2, wherein the polymerizable composition comprises 20 wt% of diepoxide propyleneglycol M.W. 600, 30 wt% of bisphenol A epoxy acrylate, 50% of propoxylated neopentyl glycol diacrylate, 1 wt% of Irgacure 149 and 1 wt% of Irgacure 261.

15-16. (Cancelled)

17. (Currently Amended) The method of ~~claim 16~~ claim 1, wherein[[:]] the polymerizable substance comprises bis(4-glycidyloxyphenyl) methane ~~(80 wt%)~~ in an amount of 80 wt% of the substance, 1,2,7,8-diepoxyoctane ~~(10 wt%)~~ in an amount of 10 wt% of the substance and neopentylglycol ~~(10 wt%);~~ in an amount of 10 wt% of the substance; the fluorescent dye comprises rhodamine 6G; and the solvent comprises 2-ethoxyethanol, 2-propanol and ethanol in a proportion of 2:2:1 [[(]]by volume[[)]].

18. (Withdrawn) The method of ~~claim 16~~ claim 1, wherein[[:]] the polymerizable substance comprises bisphenol A diglycidyl ether ~~(75 wt%)~~ in an amount of 75 wt% of the substance, 1,4-cyclohexanedimethanol diglycidyl ether ~~(5 wt%)~~ in an amount of 5 wt% of the substance, and 1,2,7,8-diepoxyoctane ~~(20 wt%);~~ in an amount of 20 wt% of the substance; the fluorescent dye comprises coumarin 314; and the solvent comprises 2-ethoxyethanol, 4-hydroxy-4-methyl-2-pentanone, 2-propanol and ethanol in a proportion of 1:1:2:1 [[(]]by volume[[)]].

19. (Withdrawn) The method of ~~claim 16~~ claim 1, wherein[[:]] the polymerizable substance comprises bisphenol A diglycidyl ether ~~(70 wt%)~~ in an amount of 70 wt% of the substance, 1,4-butanediol diglycidyl ether ~~(15 wt%)~~ in an amount of 15 wt% of the substance, bis(3,4-epoxycyclohexylmethyl) adipate ~~(5 wt%)~~ in an amount of 5 wt% of the substance and neopentyl glycol ~~ethohylate (10 wt%);~~ ethoxylate in an amount of 10 wt% of the substance; the fluorescent dye comprises coumarin 153; and the solvent comprises 4-hydroxy-4-methyl-2-pentanone, 1-butanol, 2-propanol, ethyleneglycol and 2,2,3,3-tetrafluoro-1-propanol in a proportion of 1:1:2:1:0.5 [[(]]by volume[[)]].

20. (Withdrawn) The method of claim 16, wherein: the polymerizable substance comprises diglycidyl-1,2-cyclohexanedicarboxylate (45 wt%), 3-[bis(glycidyloxymethyl)methoxy]-1,2-propanediol (45 wt%), poly(bisphenol a-coepichlorohydrin),glycidyl end-capped (m_n=480) (2 wt%) and dipentaerythritol (8 wt%); the fluorescent dye comprises rhodamine 6G; and the solvent comprises 4-hydroxy-4-methyl-2-pentanone, 1-butanol, methylethyl ketone and ethanol in proportion 2:2:1:1 (by volume).

21. (Withdrawn) The method of ~~claim 16~~ claim 1, wherein[[:]] the polymerizable substance comprises 3,4-epoxycyclohexylmethyl-3,4-epoxycyclohexane-carboxylate ~~(80 wt%)~~ in an amount of 80 wt% of the substance, 3-diglycidyl-1,2-cyclohexanedicarboxylate ~~(8 wt%)~~ in an amount of 8 wt% of the substance, poly[(o-cresyl glycidyl ether)-co-formaldehyde] ~~(m.sub.n=870) (2 wt%)~~ in an amount of 2 wt% of the substance and poly(caprolactone) triol ~~(m.sub.n=300) (10 wt%)~~ in an amount of 10 wt% of the substance; the fluorescent dye comprises oxazine 1; and the solvent comprises 4-hydroxy-4-methyl-2-penta- none, 2-methyl-3-heptanone, 3-methyl-2-butanone and cyclohexanone in a proportion of 1:1:2:2 [[(]]by volume[[)]].

22. (Withdrawn) The method of ~~claim 16~~ claim 1, wherein[[:]] the polymerizable substance comprises 3,4-epoxycyclohexylmethyl-3,4-epoxycyclohexane-carboxylate ~~(80 wt%)~~ in an amount of 80 wt% of the substance, glycerol proxylate triglycidyl ether ~~(0.1 wt%)~~ in an amount of 0.1 wt% of the substance, and poly(vinylbutyral-co-vinylalcohol-co-vinyl acetate ~~(9.9%)~~ in an amount of 9.9 wt% of the substance; the fluorescent dye comprises oxazine 1; and the solvent comprises 2-ethoxyethanol, 1-butanol, 2-propanol and 3-methyl-2-butanone in a proportion of 4:4:2:1 [[(]]by volume[[)]].

23. (Withdrawn) The method of claim 16, wherein: the polymerizable substance comprises 3,4-epoxycyclohexylmethyl-3,4-epoxycyclohexane-carboxylate (90 wt%), poly(caprolactone) triol (M_n=300) (2 wt%) and poly(vinylbutyral-co-vinylalcohol-co-vinyl acetate) (8%); the fluorescent dye comprises oxazine 1; and the solvent comprises 2-ethoxyethanol, 1-butanol, 2-propanol and 2,2,3,3,4,4,5,5-octafluoro-1-pentanol in proportion 1:1:1:4 (by volume).

24. (Withdrawn) The method of claim 16, wherein: the polymerizable substance comprises 3,4-epoxycyclohexylmethyl-3,4-epoxycyclohexane-carboxylate (90 wt%),

glycidyl methacrylate (2 wt%) and poly(vinylbutyral-co-vinylalcohol-co-vi- nyl acetate) (8%); the fluorescent dye comprises oxazine 170 and oxazine 1 in proportion 1:10 (by weight); and the solvent comprises 2-ethoxyethanol, 1-butanol, 2-propanol and 1,1,1,3,3,4,4,4-octafluoro-2-b- utanol in proportion 1:1:1:2 (by volume).

25. (Withdrawn) The method of ~~claim 16~~ claim 1, wherein[[:]] the polymerizable substance comprises 3,4-epoxycyclohexylmethyl-3,4-epoxycyclohexane-carboxylate ~~(10 wt%)~~ in an amount of 10 wt% of the substance, 4-vinyl-1-cyclohexane diepoxide ~~(70 wt%)~~ in an amount of 70 wt% of the substance, poly(propylene glycol) diglycidyl ether ~~(M.sub.n=640) (10 wt%)~~ in an amount of 10 wt% of the substance, and glycidyl methacrylate ~~(10 wt%)~~ in an amount of 10 wt% of the substance; the fluorescent dye comprises rhodamine 6G; and the solvent comprises 4-hydroxy-4-methyl-2-pentanone, 1-butanol, 1,1,1,5,5,6,6,6-octafluoro-2,4-hexanedione, and methylethyl ketone in a proportion 2:2:1:1 [[(]]by volume[[)]].

26. (Withdrawn) The method of claim 16, wherein: the polymerizable substance comprises ethylene glycol divinyl ether (85 wt%), di(ethylene glycol)divinyl ether (10 wt%) and trimethylolpropane trivinyl ether (5%); the fluorescent dye comprises coumarin 334 and pyrromethene 567 in proportion 1:1 (by weight); and the solvent comprises 2-ethoxyethanol, 2-butanol, 2-propanol, 1,1,1,3,3,4,4,4-octafluoro-2-butanol, 2,2,3,3-tetrafluoro-1-p- ropanol in equal proportions (by volume).

27. (Currently Amended) The method of claim 1, wherein step (e) comprises[[:]] ~~providing a filling composition; filling the second relief pattern with the filling composition;~~ covering the filling composition with a covering composition comprising a fluorescent dye[[;]], and causing the fluorescent dye to diffuse from the covering composition into the filling composition.

28. (Original) The method of claim 27, wherein the fluorescent dye has a first rate of diffusion in the polymerized layer and a second rate of diffusion in the filling composition, the second rate of diffusion being higher than the first rate of diffusion.

29. (Original) The method of claim 28, wherein the fluorescent dye comprises oxazine 1.

30. (Cancelled)

31. (Withdrawn) The method of claim 29, wherein the filling composition comprises 3,4-epoxycyclohexylmethyl-3,4-epoxycyclohexane-carboxylate ~~(80 wt%)~~ in an amount of 80 wt% of the filling composition, glycerol proxylate triglycidyl ether ~~(0.1 wt%)~~ in an amount of 0.1 wt% of the filling composition and poly(vinylbutyral-co-vinylalcohol-co-vinyl acetate ~~(9.9%)~~ in an amount of 9.9 wt% of the filling composition.

32. (Currently Amended) The method of claim 1, further comprising[[:]] (f) repeating steps (a)-(e) ~~aplurality~~ ~~oftimes~~ a plurality of times to form ~~aplurality~~ a plurality of information layers; and (g) adhering the plurality of information layers together to form the optical information storage medium as a multilayer medium.

33. (Currently Amended) The method of claim 32, wherein the polymerizable composition is doped with ~~3% Irgacure 1700~~ a mixture that is 25% by weight bis(2,6-dimethoxybenzoyl)-2,4,4- trimethylpentylphosphine oxide and 75% by weight of 2-hydroxy-2-methyl-1-phenylpropan-1-one in an amount of 3 wt% of the polymerizable composition.

34. (Currently Amended) The method of claim 32, wherein the polymerizable composition is doped with [[4%]] benzoyl peroxide in an amount of 4 wt% of the polymerizable composition and [[0.1%]] dibutylaniline in an amount of 0.1 wt% of the polymerizable composition.

35-37. (Cancelled)

38. (New) A method of making an optical information storage medium, the method comprising:

(a) disposing a polymerizable composition between a base and a covering layer, at least one of the base and the covering layer having a first relief pattern on a side facing the polymerizable composition;

(b) spinning the base, the polymerizable composition and the covering layer in a centrifuge to distribute the polymerizable composition;

(c) polymerizing the polymerizable composition while the polymerizable composition is distributed between the base and the covering layer to form a polymerized layer having a second relief pattern corresponding to the first relief pattern;

(d) separating the polymerized layer from the first relief pattern; and

(e) filling the second relief pattern with a fluorescent information storage material,

wherein the polymerizable composition comprises alkylacrylate and triacrylate in a ratio of about 1:0.25 to 1:16, and a photoinitiator.

39. (New) The method of claim 38, wherein the photoinitiator is present in an amount of 2-4 wt% of the polymerizable composition.

40. (New) The method of claim 38, wherein the polymerizable composition comprises oligocarbonate methacrylate in an amount of about 20 wt% of the polymerizable composition, aliphatic urethane triacrylate in an amount of about 80 wt% of the polymerizable composition, and 2,2,-dimethoxy-1,2-diphenylethan-1-one in an amount of about 2 wt% of the polymerizable composition.

41. (New) The method of claim 38, wherein the polymerizable composition comprises 3,4-epoxycyclohexylmethyl-3,4-epoxycyclohexane carboxylate in an amount of about 10 wt% of the polymerizable composition, polypropylenglycol in an amount of about 2 wt% of the polymerizable composition, tripropyleneglycol divinyl ester in an amount of about 15 wt% of the polymerizable composition, trimethylolpropane triacrylate in an amount of about 15 wt% of the polymerizable composition, and oligocarbonate methacrylate in an amount of about 58 wt% of the polymerizable composition; and

step (c) comprises using a photoinitiator comprising a mixture of 50% by weight 1-hydroxycyclohexyl phenyl ketone and 50% by weight benzophenone in an amount of about 2 wt% of the polymerizable composition, and triarylsulfonium hexafluorophosphate in an amount of 2 wt% of the polymerizable composition.

42. (New) The method of claim 38, wherein the photoinitiator comprises a quinone, an amine, or a mixture of a quinone and amine.

43. (New) The method of claim 42, wherein the photoinitiator comprises a quinone in an amount of 2 wt% of the polymerizable composition and an amine in an amount of 1 wt% of the polymerizable composition.

44. (New) The method of claim 42, wherein the quinone is phenanthrenequinone or camphorquinone and the amine is triethanolamine.

45. (New) The method of claim 38, wherein the polymerizable composition comprises modified urethane triacrylate in an amount of about 23 wt% of the polymerizable composition, 2-(2-ethoxyethoxy)ethyl-acrylate in an amount of about 5 wt% of the polymerizable composition, monopropyleneglycol acrylate in an amount of about 15 wt% of the polymerizable composition, propoxylated trimethylopropane triacrylate in an amount of about 57 wt% of the polymerizable composition, and bis(η5-2,4-cyclopentadien-1-yl)-(bis(2-6-difluoro-3-(1H-pyr-rol-1-yl)-phenyl)titanium in an amount of about 2 wt% of the polymerizable composition.

46. (New) The method of claim 38, wherein the photoinitiator comprises eosin B in an amount of 1 wt% of the polymerizable composition, dibutylaniline in an amount of 1 wt% of the polymerizable composition, and 2,2,-dimethoxy-1,2-diphenylethan-1-one in an amount of 2 wt% of the polymerizable composition.

47. (New) A method of making an optical information storage medium, the method comprising:

(a) disposing a polymerizable composition between a base and a covering layer, at least one of the base and the covering layer having a first relief pattern on a side facing the polymerizable composition;

(b) spinning the base, the polymerizable composition and the covering layer in a centrifuge to distribute the polymerizable composition;

(c) polymerizing the polymerizable composition while the polymerizable composition is distributed between the base and the covering layer to form a polymerized layer having a second relief pattern corresponding to the first relief pattern;

(d) separating the polymerized layer from the first relief pattern;

(e) filling the second relief pattern with a fluorescent information storage material,

wherein the filling composition comprises polyacrylic acid in an alcohol solution, wherein the polyacrylic acid is present in an amount sufficient to form a photosolidified layer.

48. (New) The method of claim 47, wherein the polyacrylic acid is present in an amount of 3 wt% of the filling composition.

49. (New) The method of claim 47, wherein the alcohol solution is a mixture of a glycol and an aliphatic alcohol.

50. (New) The method of claim 49, wherein the alcohol solution is a mixture of 80 wt% ethyl glycol and 20 wt% isopropanol.